HIGH SCHOOL AND UNIVERSITY MATRICULATION EXAMINATIONS BOARD.

DEPARTMENTAL EXAMINATIONS, 1928

GEOMETRY 2.

Time—Three hours.

Values.

10 **1.** (*a*) The vertices of all equal angles, standing on the same base and on the same side of it, lie on an arc of a circle passing through the extremities of the base. IV.—6. Converse.

2 (*b*) State the converse of (*a*).

2 (*c*) State (*a*) using the word "locus".

7 (*d*) *Either* The base and vertical angle of a triangle are given. Find the locus of the intersection of perpendiculars from the ends of the base on the opposite sides.

Or Two circles intersect in A and B. Through A two chords CAD, EAF are drawn, terminated both ways by the circumferences. Show that the triangles BCD, BEF are equiangular.

10 **2.** (*a*) About a given circle to describe a triangle equiangular to a given triangle. IV.—19.

6 (*b*) If another triangle equiangular to the given triangle in (*a*) be described about the given circle ABC in (*a*), show that the two triangles about the circle are equal in all respects.

10 **3.** (*a*) If two triangles are equiangular, the ratios of corresponding sides are equal. III.—5.

6 (*b*) *Either* The sides AB, AC of the triangle ABC are respectively $1\frac{3}{4}$ inches and $3\frac{1}{5}$ inches in length. From AB cut off AP one inch in length and draw PD parallel to BC. Find the length of DC.

Or Divide the given straight line AB in such a way that the ratio between the parts will be $2 : \sqrt{3}$.

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Values.

10 **4.** (*a*) If two triangles are similar, the ratio of their areas is equal to the ratio of the squares on their corresponding sides. III.—11.

7 (*b*) *Either* ABC is a triangle. Draw a triangle similar to the triangle ABC but equal to one-half the area of it.

Or ABC, DEF are two similar triangles. Find two straight lines whose lengths are in the same ratio as the areas of the triangles are to one another.

5. ABC is an obtuse-angled triangle with the angle ABC obtuse. Make the necessary projections and state exactly the value of:

2 (*a*) the square on the side AC in terms of the other sides and projection.

4 (*b*) the value of the squares on the sides BC, AB respectively, in similar terms.

10 **6.** (*a*) If from the vertical angle of a triangle a straight line be drawn perpendicular to the base, the rectangle contained by the sides of the triangle is equal to the rectangle contained by the perpendicular and the diameter of the circumcircle. Add. 19.

7 (*b*) An equilateral triangle is inscribed in a circle the radius of which is 2 inches. Find the area of the rectangle contained by the two sides of the equilateral triangle.

7 **7.** *Either* Having given the position of the points of bisection of three sides of a triangle, construct the triangle.

Or From any point P on the circumference of a circle, perpendiculars PA, PB are drawn to two fixed diameters. Show that AB is constant in length.

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